

Primitive Agriculture in Japan: Latest Jōmon Agricultural Society and Means of Production

Received 28 January 1970

MITSUO KAGAWA

INTRODUCTION

ONE OF THE important questions for archaeology in Japan is whether any other kind of grain was cultivated in the period before the known beginnings of wet rice cultivation in the Yayoi period. Naturally the search for an answer to this question focuses on the Jōmon period. Scholars have propounded a number of theories on the origins of agriculture in Japan, and some identify the mountainous region of central Honshu during the Middle Jōmon as the locus of the earliest agricultural activity. The area in which we should search, however, would seem to be not central but southwestern Japan, especially Kyushu, the island lying closest to the Asian mainland.

It is logical to assume, in the first place, that since rice itself and earlier cultivated grains such as millet and deccan grass* did not originate in Japan, both the grains and their cultivation techniques were introduced from the Chinese mainland and their earliest development took place in Kyushu. It is fortunate that field investigations in Kyushu have increased in recent years and are receiving as much attention as those in other parts of Japan. Findings of rice (husks) were reported in 1952 from Kogabaru shell mound in Kumamoto prefecture (Sakamoto 1952), but more recent investigations have not produced equivalent finds. Many scholars believe that the Kogabaru husks were mixed in with a layer of earlier material and date from a later period.

Undisputable evidence of rice cultivation was produced during the 1966 joint excavation by French and Japanese archaeologists of Kunden shell mound, Karatsu

Professor Kagawa is Dean of the Faculty of Letters, Beppu University. This article has been translated from the Japanese by Patricia Murray, Center for Japanese Social and Political Studies, Tokyo.

* Translator's note: *awa* and *hie*. Since these two terms are consistently used together in this essay, the English word "millet" will be understood to mean both when it appears alone.

City, Saga prefecture (Kyushu University 1966), when they discovered rice husks in the shell layer that contained *yusu* pottery of the Latest Jōmon. The *yusu* pottery is thought to date at about 2370 B.P. as it precedes only slightly the Itazuke-I type of Early Yayoi pottery. The situation and environment of the site is similar to those of the loess terraces of northern China where millet was grown, and, furthermore, findings of stone hoes and knives correspond to continental finds. Finally, examples of black polished vessels from the site closely resemble continental Chinese Lungshan blackware. These observations seem to support the contention that cultivation in the Latest Jōmon period was of grains other than rice. And, from the classification of the Kyushu black pottery, it is possible to conjecture that millet and deccan grass were first cultivated in the later part of the Latest Jōmon, about 3000 B.P.

ORIGINS OF JAPANESE AGRICULTURE AND THE CONTINENTAL HERITAGE

In *Children of the Yellow Earth*, J. G. Andersson asserted that agriculture was carried out in the Hwangho basin during the Yangshao period in northern China. According to the scholars who measured them (Edmon and Söderberg 1929, Hamada 1959), the rice husk patterns impressed onto pottery that Andersson offered as evidence for his theory were probably *ine* or short-grain rice "Japanese type (Japonica)." Excavation of the site of Sian Pan-po and investigation of its artifacts (Chung Kuo K'o Hsüeh Yuan 1963) confirmed the theory that agriculture in the Hwangho basin was carried out as early as the Yangshao culture and produced evidence that agricultural society existed in the Yangshao.

Since Andersson's work, the study of dry field cultivation of millet in the Hwangho basin has received more attention than investigations of early rice cultivation in that region, but recently, just as evidence of millet cultivation has been found in northern China, traces of rice growing have been discovered in central China. While the site of Sian Pan-po yielded proof of millet growing, the central China site of Ch'ü-chia-ling in Chingshan, Hupei province, contained evidence of the cultivation of rice (Ting 1955).

The cultivation of millet in northern China and the lower reaches of the Hwangho basin through the Yangshao and Lungshan cultures was carried out on highland loess plateaus. Since farming methods did not include irrigation (Okazaki 1966), the yield depended on the amount of rain between seeding and harvest, i.e., "rainwater" agriculture. A drought would have much reduced the harvest. Furthermore, because the yield per unit area was extremely low, manpower requirements were heavy, encouraging a tendency toward the formation of clan communities. The location and structures of the Sian Pan-po site give a fairly clear idea of that ancient agricultural community in China. We can find there the earmarks of the initial stage in China of the "Asian mode of production," typified by large-scale land and labor control. Hunting was carried on as well as "rainwater" agriculture, but the stone knives (harvesting type) and hoes at Sian Pan-po, and vessels such as Lungshan black pottery, had Japanese counterparts which could have stimulated the development of primitive agriculture during the Late and Latest Jōmon.

It is especially significant that sites in various parts of Kyushu dating from the very end of the Late Jōmon are situated in an environment similar to that of the

Hwangho basin. These sites have been found in hillsides and on plateaus, riverbank terraces, and other elevated areas. Most are in areas that are covered with thick volcanic ash. In this type of environment, "rainwater" agriculture which closely paralleled that of China was practiced. The term *jokkō* (耨耕) (Matsuzaki 1960) describes this kind of "rainwater" agriculture with stone hoes and implements made from a wooden stick with a hoe-shaped stone hafted onto the end. In every respect, including geographical location of the site, the type of assemblages found in the Ōishi site in Ōita prefecture best corresponds to primitive agricultural sites in the Hwangho basin. The large numbers of polished black vessels from the first half of the Latest Jōmon discovered at Ōishi drew much interest to this site. Polished earthenware vessels from Ōishi are shallow, plate-shaped dishes (Plate I) that were found together with rough, deep earthenware pots. Besides these two types a small number of clay tripod vessels (Kagawa 1961*b*) were unearthed. Unlike earlier Jōmon ware, they do not have any cord marks on them.

If we are to classify these vessels as blackware, they must correspond to finds from the south and west of the Korean peninsula, an area separated from Kyushu by only a strip of water. Millet remains have been turned up at Chit'am-ri, in Hwanghae-do on the western coast (Yi 1960), and the discovery of blackware was reported (Kim 1966) in Amsa-dong in the central Han River basin. The shape of these vessels is similar to II-type vessels from the first half of the Latest Jōmon in Kyushu. A more recent paper has been published (Kim 1967) that describes in detail finds of blackware from various sites in South Korea. It also reports that gray and orange-red pottery was discovered with the black. These finds offer data that suggest strongly the influence of China's Lungshan culture on the Korean peninsula.

What was the relationship between Korea's pottery and Northeast China? Among the finds excavated from Pi-tzu-wo, Tan-t'o-tzu (Hamada and Shimada 1929), and other sites on the Liaotung peninsula were colored pottery and stone implements that included ground, polished blades. They are thought, therefore, to be products of the Lungshan culture. The stone hoes and stone knives unearthed from both these sites correspond to implements found in Korea and, furthermore, the Yang-t'ou-wa shell mound in Lü-ta-shih (Dairen) and the site of Hong-shang-hou, Ch'ih-feng, and others, produced a considerable number of Lungshan blackware specimens along with stone tools. These sites in Liaoning province are known for the blackware they yielded, which bespeaks their close relationship with the Shantung province site of Ch'eng-tzu-yai, Li-ch'eng-hsien—the key to the Lungshan culture.

"*Jokkō*" techniques of cultivating unirrigated millet and deccan grass in the loess highlands of China were passed on to the Lungshan. As that early agriculture developed, it demanded extensive control over land and labor, leading to the formation of communal society (the "Asian" type of primitive communalism). This pattern of culture spread to Northeast China and then to the Korean peninsula. No radiocarbon dates are available for finds from northeastern China, but even though dating cannot be determined with any precision, Lungshan vessels from northeastern China bear an almost exact resemblance to both the Amsa-dong finds and Latest Jōmon polished black pottery from Kyushu. It seems probable, therefore, that a wave of Lungshan blackware penetrated Korea and Kyushu about 3000–2500

B.P. To relate Japanese black pottery to Lungshan blackware, we must place Japanese blackware within the period between the end of the Shang dynasty (roughly 1523–1028 B.C.) and the beginning of the Chou (roughly 1122–256 B.C.). Considering geography and timing in the total flow of culture, the fact that there is a gap is entirely feasible. In any case, the eastern spread of pottery of the blackware type was accompanied by primitive techniques for unirrigated agriculture, establishing a base for agricultural society in Japan in the Late and Latest Jōmon periods. On the basis of the correspondence between certain attributes of continental Chinese, peninsular Korean, and insular Japanese (Kyushu) prehistoric culture, we can posit the existence of agriculture in Jōmon before the advent of the wet-paddy system known in Yayoi.

FINDINGS FROM THE SITE OF ŌISHI, ŌITA PREFECTURE

Kyushu, lying close to both the Korean peninsula and the Chinese mainland, has produced evidence of primitive agriculture that, more than findings from other parts of Japan, indicates a close similarity to primitive agriculture of the continent. The site noted for the most significant finds is Ōishi, in Ōgata-cho, Ōno county, Ōita prefecture (Beppu University 1966).

Near the upper and middle course of the Ōno River, running east from Mt. Aso in central Kyushu, there still remain solid, well-formed terraces. On one of those riverbank terraces is the site of Ōishi. The terrace forms an extensive plateau wedged in a valley between the foot of the Kyushu mountain chain and the Tosumi River, a tributary of the Ōno (Plate II). The site was excavated first in 1960 and again in 1962. In 1965 the universities of Beppu, Tokyo, Tohoku, and Kyushu carried out a joint survey, turning up a variety of artifacts related to aspects of primitive agriculture. Another joint survey was carried out in 1966 with results that provided important clues to the structure of settlements in primitive agricultural society.

The plateau that Ōishi occupies measures about 600 m east-west and 400 m north-south. A covering of late volcanic ash has accumulated over the land, over which lies a layer of black soil. The east side is presently under cultivation, an area of about 400 m east-west by 200 m north-south. It soon became clear through excavation that this entire eastern side is the site of an extensive human settlement. The west, north, and south sides yielded remains of dwelling clusters and in roughly the center of the plateau a large pit dwelling was discovered (Kagawa 1967*a*). The dwellings each contained a flat basal stone for the center post and evidence of a wooden roof structure that was stretched to four corners from a central post. In a circle of about 5 m diameter surrounding the central stone were found earthenware and stone implements and vessels (Plate III). The almost circular area within that was packed down very hard, and the finds were scattered in such a way to indicate almost certainly that these were living quarters.

Dwellings on the south side were very dense, and on the north and west several individual dwellings could be identified. All were about the same size, and the way the finds were scattered was similar in all cases. In roughly the center of the settlement lay a large pit, slightly under 9 m diameter and 2 m deep. A circular platform or stage about 3 m across had been built in the center of the pit, and the surrounding area was graded into tiers from which people looked down on the



Plate I Latest Jōmon blackware-type burnished earthenware vessel.



Plate II Aerial view of settlement and field terraces at Ōishi. Settlement in upper right, fields (A-E), farmed by slash-and-burn method, shown arranged around settlement, with (A) immediately to the right of settlement terrace.

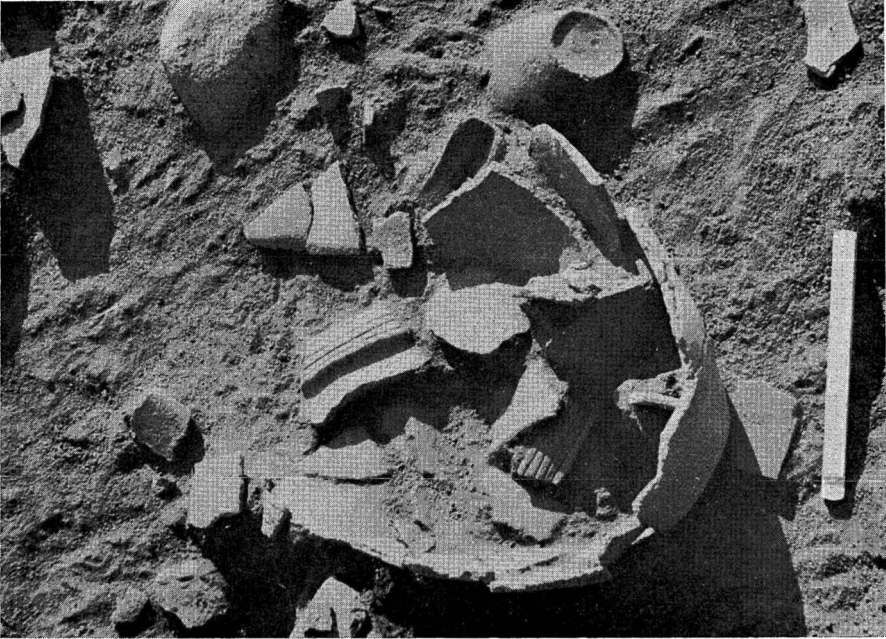


Plate III. Burial urn inside a dwelling pit at Ōishi.



Plate IV Large circular meeting-place pit at Ōishi settlement terrace. Three steps leading to center of pit are visible on lower left.

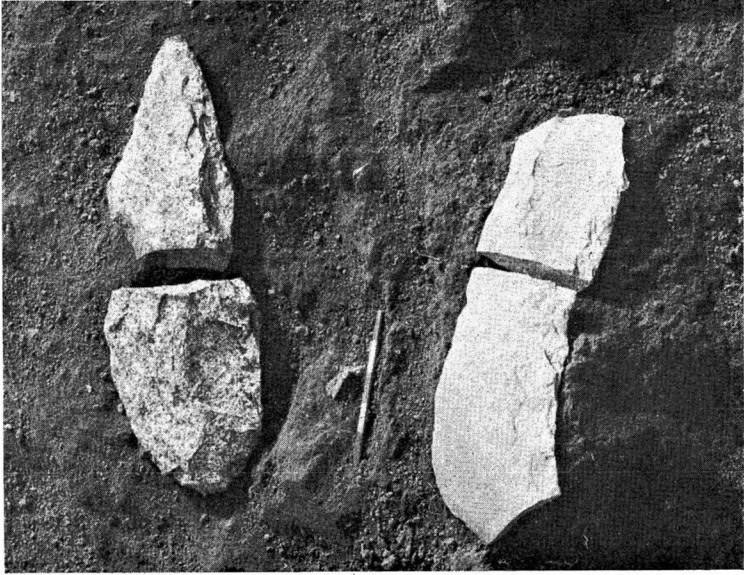


Plate V Stone hoes excavated from Ōishi (*in situ*).

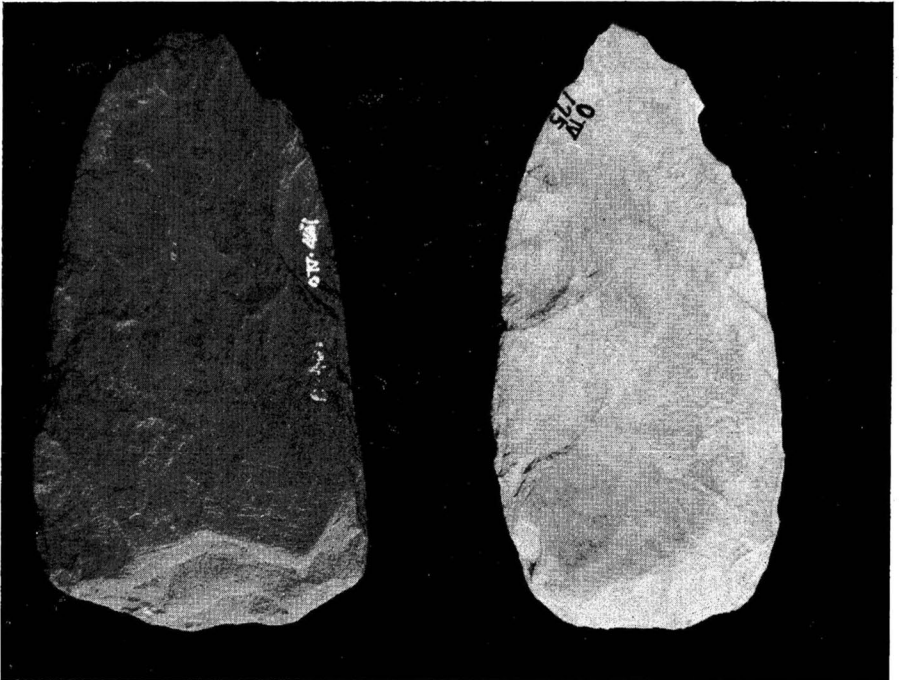


Plate VI Stone hoes from Ōishi.

platform. Clay steps, perhaps for ascending and descending, surrounded the platform, and a large sloping step that was found on the west side was possibly meant to be the focal point or place of honor (Plate IV).

This large circular pit is somewhat like European-style amphitheaters, temples, or meeting places, a type of structure that has rarely been found in Asia. Dwelling pit No. 1 in Sian Pan-po in China is also a relic from a primitive agricultural community, but it is square, and if restored, is conjectured to measure about 10 by 20 m. Some scholars believe the round pit at Ōishi was a kind of forum (Wajima 1962), which is a natural conclusion since agricultural production presupposes fairly advanced social organization that would require group meetings. It has a capacity to seat 50 people if all the tiers were filled.

It appears that this primitive settlement created dense clusters of dwellings, placing the meeting place central to all of them and leaving an open space around the central pit. Valleys surround the plateau where the settlement was located, isolating it from other slopes. This, then, is the typical pattern for primitive communities. This particular kind of community probably established areas for cultivation in places somewhat removed from the dwelling area. Stone hoes and knives have been found scattered on independent neighboring slopes but there have been no findings to indicate dwellings there. It is clear that slash-and-burn agriculture was carried out on nearby plateaus. The Ōishi site is noted as a primitive agricultural settlement consisting of the main village and surrounding independent hills for cultivation. Ōishi remains demonstrate both primitive agricultural patterns and the main features of the structure of settlements.

Artifacts that were found in the dwelling areas included implements used in agricultural production, and some of these were, as mentioned before, stone hoes (Plate V) and knives of the same kind that were used in agriculture in the Hwangho basin. With smooth, flat stones (about 5–10 cm thick), they were made by regular striking on one side, which produced a number of flakes, followed by trimming and shaping the edge according to the use for which the implement was intended. The process of preparing stone knives can be determined from the finding of finished specimens, nuclei, and flakes. I have called this process the stone-knife technique (Kagawa 1967*b*), and I have concluded that the same techniques of knife making can be seen in prehistoric Chinese stone knives. This kind of knife was held easily in the hand and was used to cut ears of ripened grain. The shape of these reaper blades was required to be uniform. Tools with the same function and shape must be made by the same techniques, and considering the rate of attrition from constant use and abrasion, new ones were constantly needed. Therefore, the demand for this particular kind of blade was relatively high. Flat, angular conglomerate stone (about 5 cm thick) was used as the base; the corners were struck off and smoothed and the bottom of the stone was rounded. This became the core. The natural, flat surface of the prepared core became the striking surface and heavy blows dealt from the top produced flat flakes that were struck off one side. Because the bottom of the stone was curved, the flakes were semilunar. If the blade were shaped carefully by chipping and trimming the sides of the flake, it became a useful stone knife for everyday work in cutting the stems of grain, and with this technique it was possible to produce large numbers of standardized tools.

Stone hoes were made the same way. Unlike the knife-making technique, there

was no need to prepare a core; hoes could be fashioned by striking the flattest natural face of a piece of conglomerate stone of about 10 cm thickness. Whether the flakes were knocked off vertically or horizontally, this method produced a large number of them (Plate VI). Fine trimming and chopping around the circumference of the flake produced the completed "head" of the hoe. Stone hoes found at Ōishi included many that were hafted straight to the end of a pole. They enhanced the "hoe," making it just slightly more effective than the digging-sticks. In some cases, a pronged stick was used and a stone head was attached on one end. These were used for tilling or digging, and so there is not much difference between this type of hoe and the perpendicularly hafted adze-blades used for farming in the Middle East. The technique for making these stone hoes (Kagawa 1967c) also corresponds to techniques for making implements of similar types in the Hwangho basin.

Besides these stone knives and hoes, which are typical farming tools, Ōishi produced paired sets of rectangular mortars and stone pestles, providing valuable clues to the agriculture of that time and place. It is significant that of all the finds at Ōishi, stone arrowheads were very few, suggesting that hunting was on the decline.

Clay vessels discovered in the dwelling area were black burnished pots in the *usute* (thin-walled) style, and just as the deep, rough earthenware vessels were of uniform type, so were many of these other vessels. According to the classification of the blackware type of burnished vessels (Kagawa 1969a), Amsa-dong blackware corresponds to II-type Latest Jōmon ware. Ōishi finds are I-type, from a slightly earlier period, and so it is reasonable to place the Korean peninsula and parts of Japan such as Kyushu in the same blackware culture sphere.

There exist examples of stone flake tools used for farming that can be identified either with the end of the Late Jōmon—chronologically a little older than Ōishi—or in the same period as Ōishi. Among them are thin obsidian blades that were made by reworking flakes into long rectangular shapes (about 2.6 cm long, 1.2 cm wide) and hafting them onto the ends of handles. We can consider these to be the functional equivalents of the Middle Eastern sickle-blades. Some have been found on the eastern coast of Korea, making it possible to trace this kind of blade to Siberia. In its function as a sickle the blade was attached to a wooden or bone or horn handle, but because stone knives were produced in such numbers and because the methods of agriculture dictated certain kinds of implements, the sickle-blade did not develop as far as stone knives (Kagawa 1968a).

LATEST JŌMON SETTLEMENTS AND MEANS OF PRODUCTION

Settlements of Latest Jōmon were established in relatively high regions, and crops had to depend entirely on rainfall for water. It is this point that raises the question of the suitability of grain to certain areas in Asia. It is claimed that rice first grew in the Bengal region, India, but recent theories place the beginnings of rice in southern China as well. In either case, rice originated in Southeast Asia. Types of grain whose origins are in China belong to the category of millet (*awa* and *hie*). These thrive in comparatively high altitudes and do not necessarily require very fertile soil. The origin of millet and deccan grass was found in the

loess zone of northern China, and it was natural that the agriculture began in that region. They are distinctly inferior as foodstuffs in comparison with rice or other grains, and they do not give abundant yield. Because of the limited yield per unit area, cultivation required large land areas and a high ratio of manpower. For that reason the agricultural society that grew up in Asia involved control from the very beginning over great expanses of land and large numbers of people. Such needs meant the evolution of large extended family units that comprised three or even four generations living together. The primitive agricultural community remains at Pan-po ts'un in China and the Latest Jōmon site of Ōishi in Kyushu are of different periods, but both communities were based on the formation of kinship groups.

As described earlier, the settlement at Ōishi occupied one of several hillsides that were relatively independent from each other, and the adjacent several terraces were used for cultivation (Plate II). In the center of the terrace that served as Ōishi's settlement area one can see the remains of the circular meeting-pit, around which were located dwelling units. This amphitheater-type structure is a huge pit immediately surrounded by what appears to have been open space (Plate IV). In and around the settlement were discovered jewelry and trinkets, including *magatama* crescent-shaped jewels and ancient *kudatama* cylindrical jewels. A number of unfinished trinkets and decorations were also discovered, making it possible to see the process of making them. There was probably a workshop of some sort in the vicinity. From this, we can conclude that the community was wealthy enough to have had precious stones and the leeway to make decorations.

The community also produced stone farming implements in very great numbers. We can assume that the paucity of stone arrowheads at Ōishi stems from the fact that by this period an agricultural economy had already become the base of the society. On the terrace that held the settlement there was only a small area of cultivated land; the main farming areas, which had to be much larger, were located on the neighboring terraces. Identifying five of those field-terraces and calling them fields (A) through (E), the settlement was central with cultivated hillsides extending in a radius of 500–1000 m (Plate II). In slash-and-burn farming one field would give a good, regular harvest for two years. After that, the harvest would diminish steadily unless the field were retired for awhile. If all of fields (A)-(E) were used in rotation, it took ten years to return to A. We can see, then, a pattern of establishing fields in areas adjoining the settlement, which was located centrally to all of them, and fields under cultivation were rotated through a ten-year cycle. The hillside on which Ōishi settlement was located was cut into by deep valleys on the south, north, and west, and on the northern edge of the plateau there is a spring. The fact that a settlement was located in a spot where a spring existed is itself interesting. That area became the base, from which extended out in a fan-shape the hillside terraces that were used for farming. Excavation of terraces (A)-(E) turned up agriculture-related artifacts, including stone hoes, knives used in harvesting, and a small number of other implements. Except for earthenware vessels, no utensils for daily domestic life were found. It also appears that the terraces were burned in their entirety, and there is an ash layer, and a burned earth layer in the layer, that contained stone implements. These observations amply indicate the patterns in which settlements were established and the neighboring hillsides used for cultivation.

Two km north of Ōishi lies Kino, a site very similar to Ōishi in the methods of cultivation and type of settlement. Kino comprises a settlement terrace and four nearby terrace fields (A-D). The south side of the settlement field complex touched fields (D) and (E) of Ōishi. Kino has only four fields, but the unit area for cultivation of each of them is relatively larger than any of Ōishi's five, so that the scale of the settlement and total productive agricultural area were about the same.

Kodakano site, 2 km northeast of Kino, was also made up of a central settlement with farmland on adjoining slopes. There are many more sites in the vicinity of Ōishi that exhibit the same features of Late and Latest Jōmon agriculture. Many have been surveyed recently and compared with Ōishi, one of the most important of which is Ōgicho and its environs, in Sakurachō, 10 km west of Ōishi.

At the eastern foot of Mt. Aso, the center of the Kyushu mountain chain that runs north-south down the middle of the island, there is a wide area of land once used for primitive farming that closely resembles the plateau region in northern China's loess zone. It had extensive fields located on volcanic-ash covered terraces running along the side of the Ōno River. The fact that primitive rain-watered agriculture developed in this type of area, both in Japan and China, reveals an important feature in the beginnings of typical Asian agriculture, although the type of grain determined to some extent the use of land and labor. This seems to be a northern pattern, distinct in its beginning period from that of the southern pattern of wet rice culture. Thus, Late and Latest Jōmon agriculture in Kyushu immediately preceded wet rice cultivation in the Yayoi period. The latter was accompanied by the spread of lowland settlements, but it is the Jōmon period that provides an example of primitive Asian agriculture of the northern type centering on production of millet.

LATE AND LATEST JŌMON BURIALS AND PRIMITIVE COMMUNAL ORGANIZATION

One of the characteristics of Japan's prehistoric culture, of Jōmon period burials in particular, was the widespread practice of flexing the corpse before interment. This was a custom Japan shared with many cultures of the Eurasian continent. Bending the arms and legs symbolized the severance of relations between the corpse and the world, isolating it (Watanabe 1965). Flexed burials have received more attention recently as successive discoveries of many such burials in various parts of Kyushu have been reported. Such burials were found in the Daionji Inari cave in Asaji-machi, Ōno county, Ōita prefecture. The feet were found bent in such a way that the toe bones were found inside the rib cage. This is thought to have been accomplished by cutting the torso open in the abdominal region and placing the feet inside, to keep them bound and to prevent the body from standing up or walking away. Kusaki cave in the same region also contained evidence of practices that are important to the study of primitive religion. A skull was found, for example, with an opening bored in the left side to extract the brains (Kagawa 1967*d*). Yamaga shell mound in Ashiya-machi, Onga county, Fukuoka prefecture, contained a corpse which had been buried after removal of all the bones in the upper torso—the spine, ribs, and breastplate (Nagai 1965). This way of preparing the body perhaps originated from the belief that by removing the bones it was possible to dislodge the spirits that supposedly dwelt inside the chest. These examples from Kusaki

cave and Yamaga shell mound both belong to the category of Late Jōmon flexed burials. They are clear demonstrations of the belief that flexing the body would finally separate the corpse from the living world.

Flexing the corpse as part of the burial rite expresses one of the most primitive concepts of passing into another world that is known today, and it is found to have existed in burial customs all over Asia. Placing the body in an urn or coffin as a way to break ties with the world appears, furthermore, to be directly related to the development of agricultural society. At Sian Pan-po, corpses of children were found in urns, adult corpses were interred in *dōko* (土壙), elongated shallow trenches dug to slope at both ends, and grain and other items were found in jars nearby. We can estimate the development of urn burials in southwestern Japan to fall in the latter half of the Late Jōmon period, about 3000 B.P. Miyashita shell mound in Tomie-machi, Gotō Islands, Nagasaki prefecture, contained one jar for grave goods with each flexed corpse. At the site of Wakimisaki in Nomo-machi in Nagasaki prefecture, corpses buried in prepared trenches were found with a jar placed near the head, and in other instances the thoracic region was covered with half an urn. At Ikada, in Nagasaki prefecture, urns were found with jars lying here and there around them. These examples of burials are all from the Late Jōmon, and like those found at Sian Pan-po, grain placed in jars that were left close by is thought to have been intended as grave goods.

We think these practices constituted a fixed rite in which the body was placed in an urn and burial objects put nearby—a rite closely related to the rise of agriculture. It is probable, therefore, that the formation of agricultural society was accompanied by the development of a prescribed burial system (Kagawa 1969*b*, 1970). With the spread of agriculture, burial practices grew away from their individual orientation and became communal rites; with communal graveyards came communal rites of death.

A section of the site at Kureishibaru in Shimabara city, Nagasaki prefecture, yielded an abundance of urn burials. In the center of that “communal graveyard” there is a pit 2.5 m on a side, and in the center of the pit there is an upright stone around which other stones are arranged. The presence of many urns all around the trench indicates that the central stone was a part of some ritual structure connected with death (Kagawa 1969*b*: 34). In every region of Asia and coastal areas of the Pacific there has existed at some time the belief that every being, animate or inanimate, has a soul; stone cults were the expression of this animism. Our knowledge of these cults gives further support to the theory that the Latest Jōmon site of Kureishibaru offers, in the stone formation amidst a large number of urns, a concrete example of a communal religious monument centered around stone.

In the Late Jōmon period we find the emergence of agriculture and the concomitant appearance of urn burials and religious ritual accompanied by the practice of placing jars filled with grain near the body as grave goods. With the growth and spread of agriculture in the Latest Jōmon, communal life became more pronounced, also influencing religious and burial rites. This development is symbolized by the stone formation-urn burial combination. From all over the southwest of Japan today come continuous reports of discoveries that give us valuable data for analysis of the relation between agricultural development and the burial system of the Jōmon period.

Studies of the findings at Ōishi have demonstrated that agriculture was the economic base for primitive community life; from there, communal groupings inevitably gave way to primitive class society. This is illustrated by findings at the Latest Jōmon site of Harayama in Minami Takaki county, Nagasaki prefecture, where a great many *shisekibo* (支石墓) or dolmen-type graves (Kagamiyama 1955a-b, Mori and Okazaki 1962) and urn burials were found. The dolmens, consisting of a large capstone supported by a number of smaller stones, were meant either as the grave of a clan chieftain or as a structure symbolizing the importance of the communal graveyard—such a development might have been influenced by more advanced rice-growing tribes. In either case, these dolmen-type remains strongly suggest some kind of class differentiations. It is safe to assume that their existence in a field of urns at Harayama probably points to the emergence of classes from within primitive communal society, symbolizing the transition to a new social structure.

Late Jōmon urn burials and the rise of religious ritual both represent aspects of an individual-centered kind of worship. In contrast, the Latest Jōmon site of Kureishibaru provides evidence of a communal burial ground and communal ritual. Ōishi, as we have seen, offers valuable clues to the concrete aspects of settlement and production in primitive communal society. With the disappearance of arrowheads, the number of hoes and farm implements increased, which in turn led to greater agricultural production as well as the eventual appearance of class society, as seen at Harayama. There the existence of dolmens in association with urn burials provides convincing evidence to support this hypothesis.

WET RICE CULTIVATION AND CONTROL OF PRODUCTIVE PADDY

Techniques for wet rice cultivation were brought into Kyushu at the very end of the Latest Jōmon period. That period can be subdivided into three (I, II, and III), corresponding to the three main types of Latest Jōmon pottery. Evidence of wet rice cultivation first appears during the peak period of III-type pottery, remaining examples of which are impressed with rice husks (Kyushu University 1962). In 1967, carbonized rice husks were discovered at the Kunden shell mound in Karatsu City (Kyushu and Paris Universities n.d.). Latest Jōmon III-type pottery, coming just before the beginning of the Yayoi period, is radiocarbon dated at about 2370 B.P. Kunden shell mound occupies a position on the mountain side of a low alluvial plain whose coastal side is enclosed by sand dunes. The soil is rich and damp. It was first cultivated when alluvial deposits began to accumulate, later forming the broad Karatsu Plain, and it is the site of Japan's earliest known wet field cultivation. The strip of land between the Kunden remains and present-day sand dunes is a natural extension that gradually formed as deposits accumulated, providing increasing space for new fields as it grew. Consequently a large assortment of Yayoi remains has been found there. The Karatsu Plain is one of the oldest sites of wet field cultivation in Japan, and, together with the southern part of the Korean peninsula, is useful for comparison with areas of early cultivation on the Asian mainland.

Concurrent with the beginning of paddy cultivation came the opening of the wet lowland and the formation of settlements as communities gathered on the wide

plain. On a scale that had no precedent, the largest plain in Kyushu, the Fukuoka Plain, had been quickly and extensively developed into paddy by the middle of the Yayoi period. Wet rice culture was thus concentrated in lands enriched and fertilized by the steady accumulation of alluvial soil in the damp lowlands.

Whereas Latest Jōmon settlements were found on terraces, particularly on independent hillsides where kinship groups formed self-sufficient communities, the lowland pattern consisted of the grouping together of several clans in a settlement enclosed within a circular ditch, governed by a tribal leader. The damp, low nature of the land created deep and muddy paddies. Here, also, because the yield was low, productivity depended on centralized control over large numbers of organized workers and adequate areas of land. Whether wet rice or dry field millet, Late and Latest Jōmon agriculture evinced the same typically "Asian" pattern of agricultural organization.

Fukuoka and other broad plains contained many primitive settlements (Kagamiyama 1955-56), which were crisscrossed with ditches and circular trenches to demarcate clan territory. The sites most often selected for such settlements were slightly projected areas stemming out of the foot of the mountains, from where they looked down on the fertile plain. As wet rice cultivation moved further into the lowlands, paddies spread out onto river deltas and along the alluvial strip, and settlements themselves gradually moved down onto the lowlands. Availability of extensive fertile land and the growth of control over productive paddy and large numbers of people gave rise to class distinctions in community organization. Social development during the Yayoi can be seen through studies of Usa Plain in Ōita, where lines of social stratification have become more clearly defined in the remains left in settlements there.

Yayoi culture developed on the terraces of the south side of the Yakan River looking down on the Usa Plain. Excavation of a large settlement area at the Early-Middle Yayoi site of Uedabara produced remains of five settlements. Each is surrounded by a ditch to make a circular area of about 50 m diameter, and there are traces of about 50 dwellings altogether. Paddy cultivation was carried out in the lower reaches of the Yakan River, whose deposits were steadily adding to the width of the plain. As it expanded, the accumulating soil steadily filled in the broad marsh that lay within a rim of dunes, bringing the plain further toward the mouth of the river. Between the end of the Middle Yayoi and the Late, settlements were built up in lowland areas that had been cultivated during the Early Yayoi. The marsh grew into firm land, becoming a vast, rich plain. The site at Beppu contains a lowland settlement encircled by a trench, and, because the density of dwellings within the trench is much higher than at Uedabara, it is definitely thought to be the later of the two, probably exemplifying the formation of a large, extended clan community.

As the alluvial plain expanded from the Yakan River, filling in the marsh, settlements of the Latest Yayoi moved into the lower reaches of the river. Like floating islands in the middle of the marsh, they were formed by building embankments, within which settlements were located, and then digging trenches around the outside. Marsh cultivation produced deepwater fields, making the use of boats and very high wooden clogs necessary to move around in them. It also demanded an even larger farming population than earlier. The necessity to organize large numbers

of people made social distinctions inevitable. At Uedabara, which commands a wide prospect of the plain, there still exist large grave mounds of the tumulus type. It was probably from this site that control over the Usa Plain was exerted. Funerary objects found inside the tumuli include Chinese mirrors brought from the mainland (Umehara 1923). The division of land on the plain was determined according to *jōriseido* (条里制度), the system practiced by the Yamato court, in which all farmland was divided into equal squares and then subdivided to form a checkerboard pattern. We think, then, that control of the area by Yamato had been firmly established by that time.

Since ancient times Usa Shrine has been honored in Japan; it marks the area where wet rice cultivation was begun in Japan during the Yayoi period and where the patterns for successful control of the most productive land were established. We can see at Uedabara the features of Japan's characteristically "Asian" primitive agriculture—communal management and control over large groups of farmers in the cultivation of wet rice.

The progress of Yayoi culture in the Usa Plain demonstrates a pattern common to social development in the Yayoi wet rice culture areas of Kyushu and western Japan. That development is even more striking in the broad Fukuoka and Chikugo River plains, where it is thought that tribal states eventually formed. Those kingdoms had the power to rule the primitive communes, overseeing cultivation and controlling field labor. If these can be considered attributes of states, Yayoi societies might be called primitive communal "states."

CONCLUSION

I believe that the origins of Japan's agrarian culture are relatively late, appearing at the end of the Jōmon period. More daring theories will point to evidence of agriculture in central Japan and Kyushu that dates back as far as the Middle Jōmon, while more conservative estimates will place the origins of agriculture in the paddy cultivation of the Yayoi. The theory of Middle Jōmon origins is weakened by the lack of concrete evidence related to agricultural activities and the agricultural society. On the other hand, to see wet rice cultivation of the Yayoi as the beginning of agriculture in Japan is to give unjustified emphasis to the similarity between polished stone implements from the Chinese mainland and Japanese artifacts and to overlook the important similarities between many aspects of Jōmon culture and the genuine continental heritage. Both arguments are weak in structural analysis—of agricultural society, religious beliefs and practices, production methods, or others.

To find the origins of agriculture in the Japanese islands we must first establish the location and the time. Kyushu, being the southernmost main island and that part of Japan closest to China and Korea, is the most likely place to look. Time must be ascertained by comparing primitive agriculture in Kyushu with that of the Asian mainland. Then, comparing corresponding sites and artifacts, we find that the formative and developmental period of the Lungshan culture in China was characterized by the spread of blackware to neighboring regions, to Korea and then Japan. Umehara Sueji (1969) has suggested a correspondence between Chinese blackware types and Latest Jōmon and Yayoi pottery. This subject was important

in my own study also (Kagawa 1960, 1961*a*), as well as the examination of stone farming implements and their relation to the continent (Kagawa 1968*b*).

It is most appropriate, on the basis of the present study of Japanese archaeology, to look for the origin of agriculture in Japan in the Late and Latest Jōmon periods, based on a detailed analysis of pottery and stone implements as well as settlements and the system of agricultural production. Perhaps the most important related aspect of that work will be careful examination of both the findings and reports done in Korea and China.

ADDENDUM

Since I submitted my paper, the study of archaeology has flourished in various parts of the southern Korean peninsula, and important discoveries about the origin of agriculture are being made. The bronze ritual ornaments found in Kwaejong-dong in Taejon are of special interest; they are presumed to have been made in the third or second century B.C. Pictures have been carved on these ornaments; these pictures show farmers holding spades in their hands while pressing down on them with one foot. Fine lines representing furrows are carved under the pictures. The fact that these ornaments belonging to the end of the Jōmon period are decorated with agricultural scenes (carvings depicting farmers) should make us reconsider the question of the relation between the Korean peninsula and southwestern Japan. Another question worth considering is the relation between the black pottery found recently in the basin of the Rakutong River and the pottery belonging to the end of the Jōmon period in southwestern Japan.

REFERENCES

BEPPU UNIVERSITY

- 1966 Jōmon banki nōkō bunka ni kansuru gōdō chōsa: Shōwa 40 nen chōsa [1965 joint survey on the agrarian culture of the Latest Jōmon period]. Beppu, Kyushu.

CHUNG KUO K'Ō HSŪEH YUAN (KAO GU YAN JIU SUO) [Chinese Academy of Sciences, Institute of Archaeology]

- 1963 Sian Pan-po: yuanshi minzu gongshe julao weiji [Sian Pan-po: remains of a settlement of a primitive tribal commune]. Peking: Sian Pan-po Museum.

EDMON, G., and E. SÖDERBERG

- 1929 Auffindung von Reis in einer Tonscherte aus einer etwa fünftausendjährigen chinesischen siedlung. *Bulletin of the Geological Society of China* VIII:4.

HAMADA, HIDEO

- 1959 *Ine no Nihonshi* [Rice in Japanese history].

HAMADA, KŌSAKU, and SADAHIKO SHIMADA

- 1929 Pi-tzu-wo. *Tōhō kōkōgaku sōsho* 1.

KAGAMIYAMA, TAKESHI

- 1955*a* Kamekan ruikō [Further thoughts on urns]. *Shien* 62. Fukuoka: Kyushu University.
 1955*b* Dolmens in western Japan. *Studies in History* 3. Fukuoka: Kyushu University.
 1955- Kankō jūkyō shi shōron [A short essay on the remains of dwellings encircled by ditches]
 1956 1, 2. *Shien* 67, 71.

KAGAWA, MITSUO

- 1960 Chūgoku senshi doki no eikyō [Influence of Chinese prehistoric earthenware]. *Kodaigaku kenkyū* 25.
- 1961a Jōmon kōbanki ni okeru tairiku bunka no eikyō [Influence of Chinese culture in the Late and Latest Jōmon period]. *Rekishi kyōiku* IX:2. Tokyo: Nihonshoin.
- 1961b Jōmon kōbanki no tairiku bunka no eikyō [Influence of Chinese culture in the Late and Latest Jōmon period]. *Rekishi kyōiku* IX:3. Tokyo: Nihonshoin.
- 1967a Enkei dokō no hakkutsu (Ōishi iseki) [Excavation of a round trench grave (Ōishi site)]. *Kōkōgaku jōnaru*. Tokyo.
- 1967b Jōmon banki nōkō bunka ni kansuru ichi mondai: sekitō gihō [A question in the agrarian culture of the Latest Jōmon period: stone knife techniques]. *KZ* 52:4.
- 1967c Jōmon kōbanki nōkō bunka no ichi mondai: ishi guwa nado ni tsuite no bunrui to gihō [A question in the agrarian culture of the Late and Latest Jōmon period: the techniques and classification of stone hoes]. *Shisō* 11. Tokyo: Nihon University.
- 1967d Ōita ken Kusaki dōketsu [Kusaki cave in Ōita prefecture]. *Nihon no dōketsu iseki* [Cave sites in Japan]. Tokyo: Nihon Kōkōgaku Kyokai Dōketsu Chōsa Inkai.
- 1968a Nihon sekki jidai no nōkō mondai [The problem of agriculture in the Stone Age in Japan]. *Rekishi kyōiku* 16:4. Tokyo: Nihonshoin.
- 1968b Problème de la civilisation agricole à l'époque de *ban-en* l'ère de Jōmon. *Memoirs of Beppu University* no. 15.
- 1969a Jōmon banki Kyushu [Latest Jōmon Kyushu]. *Kōkōgaku kōza* 2. Tokyo: Sōgensha.
- 1969b Jōmon jidai no kamekan [Urn burials of the Jōmon period]. *Kōkōgaku jōnaru* 34, 35, 37. Tokyo.
- 1970 Jōmon jidai no maisō [Burials of the Jōmon period]. *Jinruigaku kōkōgaku kenkyū* 2. Medical Faculty, Nagasaki University.

KIM, WOL-LYU

- 1966 *Kankoku kōkōgaku gairon* [Archaeology in South Korea].

KIM, WAN-HAK

- 1967 *Kankoku ni okeru kokutō bunka no mondai* [Blackware Culture in South Korea].

KYUSHU UNIVERSITY

- 1966 Hokubu Kyushu (Karatsushi) senshi shūroku iseki no kenkyū gōdō chōsa: Shōwa 40 nen Nichi-Futsu gōdō chōsa hōkoku [Joint survey and study of prehistoric settlement sites in North Kyushu (Karatsu City): Report on joint Japanese-French survey 1965]. *Kyushu kōkōgaku* 29, 30. Fukuoka.

KYUSHU UNIVERSITY FACULTY OF AGRICULTURE, DEPARTMENT OF BREEDING SCIENCE, AND FACULTY OF LITERATURE, DEPARTMENT OF ARCHAEOLOGY

- 1962 Kyushu shutsudo kodai mae ichiran [Rice in the excavations in Kyushu]. *Kyushu kōkōgaku* 15. Fukuoka.

KYUSHU UNIVERSITY AND UNIVERSITY OF PARIS

- n.d. Hokubu Kyushu senshi shūroku no gōdō chōsa [Report on the joint investigation of primitive settlements in North Kyushu]. Joint Report by Kyushu University and the University of Paris on the discovery of husks in the Kunden shell mound, 1965. Forthcoming.

MATSUZAKI, TOSHIKAZU

- 1960 *Chūgoku no senshi jidai kodochitai* [Prehistoric China: the loessic zone]. Tokyo: Yūzankaku.

MORI, TEIJIRŌ, and KEI OKAZAKI

- 1962 Shimabara hantō Harayama iseki [The Harayama site in Shimabara peninsula]. *Kyushu kōkōgaku* 14. Fukuoka.

NAGAI, MASABUMI

- 1965 Fukuoka ken, Ongagun, Yamaga kaizuka jinkotsu hakkutsu gaihō [General report on the excavation of human skeletons from Yamaga shell mound, Onga county, Fukuoka prefecture]. *Kyushu kōkōgaku* 25, 26. Fukuoka.

OKAZAKI, KEI

- 1966 Kome o chūshin toshite mita Nihon to tairiku kōkōgakuteki chōsa no gendankai [The present stage of archaeological investigation of Japan and China with special reference to rice]. *Kodaishi kōza* 13.

SAKAMOTO, KEIGYŌ

- 1952 Kogabaru kaizuka chōsa shōhō [Selected report on Kogabaru shell mound]. *Kumamoto ken bunkazai chōsa hōkokusho*. Kumamoto Prefectural Board of Education.

TING-YING

- 1955 Jiang-lian piangong xinshiqi shidai hongshaotuzhong de Daoquiao kaocha [Study of rice husks found in the red burned soil of the Neolithic period in the Jiang-lian plain]. *KKHP* 9.

UMEHARA, SUEJI

- 1923 Buzen Usagun Akazuka kofun chōsa hōkoku [Report of investigation of Akazuka tumulus, Usa county, Buzen]. *KZ* 14:3.
 1969 Kyushu ni okeru Chūgoku shizen no kokutōkei no doki [Blackware-type earthenware from prehistoric China in Kyushu]. *Shirin*.

WAJIMA, SEIICHI

- 1962 Higashi Asia nōkō shakai ni okeru futatsu no kata [Two patterns of agricultural society in East Asia]. *Kodaishi kōza* 2.

WATANABE, MAKOTO

- 1965 Jōmon jidai ni okeru genshi nōkō to maisō kannen no henshitsu [Primitive agriculture and changes in the concept of burials in the Jōmon period]. *Fuji National Park Museum Occasional Papers* 14.

YI, JIN-HUI

- 1960 Chit'am-ri, Hwanghae-do, no hakkutsu [Excavation of Chit'am-ri site in Hwanghae-do]. *Sundai shigaku* 10. Tokyo: Meiji University.